What is claimed is:

1. In a blown film extrusion apparatus in which film is extruded as a tube from an annular die and then pulled along a predetermined path, an apparatus for startup of said extruded film tube, comprising:

(a) means for varying a quantity of air within said extruded film tube, including:

(1) a supply blower which supplies air to said extruded film tube in an amount corresponding to a supply control signal, and

(2) an exhaust blower which exhausts air from said extruded film tube in an amount corresponding to an exhaust control signal; and

(b) a controller member including executable program instructions which define at least one control routine for automatic and coordinated control of said means for varying during starting of said extruded film tube by directing a series of supply control signals to said supply blower and exhaust control signals to said exhaust blower.

2. An apparatus according to Claim 1, further comprising:

(c) a control interface for receiving operator instructions during startup of said extruded film tube; and

(d) wherein said controller further includes program instructions for receiving said operator instructions and integrating said operator instructions into said at least one control routine.

3. An apparatus according to Claim 1, wherein said at least control routine comprises at least one of the following routines:

(a) a startup routine wherein said controller member initiates operation of said supply blower and said exhaust blower by first initiating operation of said supply blower in accordance with at least one predetermined operating parameter, and then initiating said exhaust blower in accordance with at least one predetermined operating parameter; and

(b) a blower optimization routine wherein at least one of (1) said supply control signal, and (2) said exhaust control signal is determined at least in part from at least one prior recorded control signal.

4. An apparatus according to Claim 3, wherein said startup routine includes executable program instructions for:

(1) initially increasing air supplied by said supply blower to said extruded film tube in accordance with a predetermined ramping function until said extruded film tube is substantially closed; and

(2) then increasing air exhausted by said exhaust blower from said extruded film tube in accordance with a predetermined ramping function.

5. An apparatus according to Claim 4, wherein said startup routine further includes executable program instructions for:

(3) continued increasing operation of at least one of said supply blower and said exhaust blower in accordance with at least one predetermined function.

6. An apparatus according to Claim 1, further comprising:

(c) a valve member, under control of said controller member, for varying admission of air into said extruded film tube and for controlling the circumference of said extruded film tube after startup of said extruded film tube.

7. An apparatus according to Claim 6, wherein said at least one control routine comprises at least one of the following routines:

(a) a startup routine wherein said controller member initiates operation of said supply blower and said exhaust blower by first initiating operation of said supply blower in accordance with at least one predetermined operating parameter, and then initiating said exhaust blower in accordance with at least one predetermined operating parameter; and

(b) a blower optimization routine wherein at least one of (1) said supply control signal, and (2) said exhaust control signal is determined at least in part from at least one prior recorded control signal; and

(c) a valve optimization routine wherein an operating condition is established for at least one of (1) said supply blower, and (2) said exhaust blower in a manner which optimizes operation of said valve member.

8. An apparatus according to Claim 7, wherein, during said valve optimization routine, operating conditions are established for at least one of (1) said supply blower, and (2) said exhaust blower, in order to allow said valve member to operate in a preferred and substantially linear range of closure conditions.

9. An apparatus according to Claim 1, further comprising:

(c) at least one transducer for producing a signal corresponding to a detected position of said extruded film tube;

(d) wherein said at least one control routine includes:

(1) a bubble break detection routine wherein said signal generated by said at least one transducer is utilized in combination with at least one software timer in order to detect a break in said extruded film tube.

SCANNED 18

10. An apparatus for extruding a film tube, comprising:

(a) a die member;

(b) means for supplying molten film to said die member;

(c) a supply blower for supplying air to said extruded film tube in an amount corresponding to a supply control signal;

(d) an exhaust blower for exhausting air from said extruded film tube in an amount corresponding to an exhaust control signal;

(e) a valve for controlling air flow from said supply blower to said die member in response to a valve control signal;

(f) a position sensor for providing a signal indicative of the size of said extruded film tube;

(g) A controller member including executable instructions which define at least one control routine;

(h) a control interface for receiving operator instructions; and

(i) said at least one control routine including:

a startup routine for automatic and coordinated control of said supply blower and said exhaust blower during start-up of said extruded film tube.

11. An apparatus according to Claim 10, wherein said at least one control routine includes:

(1) a startup routine wherein said controller member initiates operation of said supply blower and said exhaust blower by first initiating operation of said supply blower in accordance with at least one predetermined operating parameter, and then initiating operation of said exhaust blower in accordance with at least one predetermined operating parameter; and

(2) a blower optimization routine wherein at least one of (a) said supply control signal, and (b) said exhaust control signal is determined at least in part from at least one prior recorded control signal.

SCANNED #12

12. An apparatus according to Claim 11, wherein said startup routine includes executable program instructions for:

(a) initially increasing air supplied by said supply blower to said extruded film tube in accordance with a predetermined ramping function until said extruded film tube is substantially closed; and

(b) then increasing air exhausted by said exhaust blower from said extruded film tube in accordance with a predetermined ramping function.

13. An apparatus according to Claim 12, wherein said startup routine includes executable program instructions for:

(c) continued increasing operation of at least one of said supply blower and said exhaust blower in accordance with at least one predetermined function.

14. An apparatus according to Claim 11, wherein said at least one control routine further includes:

(3) a valve optimization routine wherein an operating condition is established for at least one of (a) said supply blower, and (b) said exhaust blower in a manner which optimizes operation of said valve member.

15. An apparatus according to Claim 14 wherein, during said valve optimization routine, operating conditions are established for at least one of (1) said supply blower, and (2) said exhaust blower, in order to allow said valve member to operate in a preferred and substantially linear range of closure conditions.

16. An apparatus according to Claim 11, wherein said at least one control routine further includes:

(3) a bubble break detection routine wherein said signal generated by said position sensor is utilized in combination with at least one software timer in order to detect a break in said extruded film tube.

SCANNED # 18

17. A method of startup of an extruded film tube in a blown film extrusion apparatus, comprising:

(a) providing a controller, a supply blower, and an exhaust blower;

(b) utilizing said supply blower to supply air to said extruded film tube in an amount corresponding to a supply control signal;

(c) utilizing said exhaust blower to exhaust air from said extruded film tube in an amount corresponding to an exhaust control signal; and

(d) utilizing said controller member for executing program instructions which define at least one control routine for automatic and coordinated control during starting of said extruded film tube by directing a series of supply control signals to said supply blower and exhaust control signals to said exhaust blower.

18. A method according to Claim 17, further comprising:

(e) providing a control interface for receiving operator instructions during startup of said extruded film tube; and

(f) wherein said controller further executes program instructions for receiving said operator instructions and integrating said operator instructions into said at least one control routine.

19. A method according to Claim 17, further comprising:

(e) utilizing said controller to execute program instructions of a startup routine wherein said controller member initiates operation of said supply blower and said exhaust blower by first initiating operation of said supply blower in accordance with at least one predetermined operating parameter, and then initiating said exhaust blower in accordance with at least one predetermined operating parameter; and

(f) utilizing said controller to execute program instructions of a blower optimization routine wherein at least one of (1) said supply control signal, and (2) said exhaust control signal is determined at least in part from at least one prior recorded control signal.

20. A method according to Claim 19, wherein said startup routine includes executable program instructions for:

(1) initially increasing air supplied by said supply blower to said extruded film tube in accordance with a predetermined ramping function until said extruded film tube is substantially closed; and

(2) then increasing air exhausted by said exhaust blower from said extruded film tube in accordance with a predetermined ramping function.

21. A method according to Claim 20, wherein said startup routine further includes executable program instructions for:

(3) continued increasing operation of at least one of said supply blower and said exhaust blower in accordance with at least one predetermined function.

22. A method according to Claim 17, further comprising:

(e) providing a valve member, under control of said controller member, for varying admission of air into said extruded film tube and for controlling the circumference of said extruded film tube after startup of said extruded film tube.

23. A method according to Claim 22, wherein said at least one control routine comprises at least one of the following routines:

(1) a startup routine wherein said controller member initiates operation of said supply blower and said exhaust blower by first initiating operation of said supply blower in accordance with at least one predetermined operating parameter, and then initiating said exhaust blower in accordance with at least one predetermined operating parameter; and

(2) a blower optimization routine wherein at least one of (1) said supply control signal, and (2) said exhaust control signal is determined at least in part from at least one prior recorded control signal; and

(3) a valve optimization routine wherein an operating condition is established for at least one of (1) said supply blower, and (2) said exhaust blower in a manner which optimizes operation of said valve member.

24. A method according to Claim 23, wherein, during said valve optimization routine, operating conditions are established for at least one of (1) said supply blower, and (2) said exhaust blower, in order to allow said valve member to operate in a preferred and substantially linear range of closure conditions.

25. A method according to Claim 17, further comprising:

(e) providing at least one transducer for producing a signal corresponding to a detected position of said extruded film tube;

(f) wherein said at least one control routine includes a bubble break detection routine wherein said signal generated by said at least one transducer is utilized in combination with at least one software timer in order to detect a break in said extruded film tube.

26. An improved blown film extrusion apparatus, comprising:

(a) a die for receiving molten material and extruding a film tube;

(b) a controller member;

(c) a supply blower which is responsive to command signals from said controller for supplying a variable quantity of air to said film tube;

(d) an airflow path between said supply blower and said die;

(e) an exhaust blower which is responsive to command signals from said controller for exhausting a variable quantity of air from said film tube;

(f) an air flow control member which is at least in-part responsive to command signals from said controller member for varying a quantity of air passing within said air flow path, and which includes:

(1) a housing with an inlet, an outlet, and an air path defined therethrough;

(2) at least one selectively-expandable flow restriction member disposed in said housing in said air flow path; and

(3) wherein said air flow member selectively expands and reduces said at least one selectively-expandable flow restriction member to moderate air flow through said air flow path.

(g) at least one program routine executable by said controller member which optimizes operation of said supply blower, said exhaust blower, and said air flow control member.

27. An improved blown film apparatus according to Claim 26:

(h) wherein said at least one selectively-expandable flow restriction member includes a bladder member which selectively communicates with a control fluid; and

(i) wherein application of said control fluid to said at least one selectively-expandable flow restriction member causes expansion and reduction of said at least one selectively-expandable flow restriction member.

28. An improved blown film apparatus according to Claim 26, wherein said air flow control member includes:

(1) a plurality of housings, each having an inlet, outlet, and an air flow path defined therethrough;

(2) a plurality of selectively-expandable flow restriction members disposed in each of said housings; and

(3) with each flow path through said plurality of housings in at least one of (a) series, and (b) parallel communication with said selected others of said air flow paths.

29. An improved blown film apparatus, according to Claim 26, wherein:

(h) expansion of said at least one selectively-expandable flow restriction member restricts said air path defined through said housing; and

(i) reduction of said at least one selectively-expandable flow restriction member expands said air path defined through said housing.